THE ROLE OF BIOLOGISTS IN ENVIRONMENTAL IMPACT ASSESSMENT AND WATER RESOURCE PLANNING

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Corps of Engineers policy on multiobjective planning is largely derived from several legislative and executive authorities which include the National Environmental Policy Act (1970) River and Harbor and Flood Control Act (1970) Federal Water Pollution Control Act Amendments (1972) Water Resources Development Act (1974) and Principles and Standards for Planning Water and Related Land Resources (1973). These authorities establish and define the national objectives for water resource planning, specify the range of impacts that must be assessed, and set forth the conditions and criteria which must be applied when evaluating plans. The Corps of Engineers recently published comprehensive planning procedures entitled *Planning Process: Multiobjective Planning Framework* which established a process under which the task of impact assessment was incorporated into the overall planning process. The four major tasks in water resource planning are: problem identification, formulation of alternatives, impact assessment, and evaluation.

Problem identification (task 1) provides an opportunity for establishing fish, wildlife and other biological objectives which give direction to subsequent tasks. Problem identification is carried out by identifying public concerns, analyzing biological resource management problems, defining the study area, describing the base condition, projecting future conditions and establishing planning objectives.

In identifying public concerns, the general public, preservation/conservation organizations, state fish and game agencies and the Fish and Wildlife Service must be consulted to obtain their views regarding what the study should address (i.e., what are the fish and wildlife needs and opportunities?). When analyzing biological resource management problems the full complement of issues, concerns, needs, constraints, opportunities and desires of the various publics in relation to biological resources must be reflected in the study (i.e., stream versus lake fishery). Depending upon the character and range of the biological resource problems to be studied, the study area may or may not have the same boundaries as the area described in the study authority (i.e., travel lanes and migratory routes beyond project boundaries). The description of the base condition should summarize existing biological conditions in the study area (i.e., conditions contributing to water quality). Drawing on the public concerns regarding existing and future biological problems and opportunities in the study area, including a thorough analysis of the base condition, a reasonable number of alternative future conditions should be projected (i.e., displacement of wildlife by industrialization versus displacement of wildlife by a lake versus retention of wildlife by land purchase and deeication to a wildlife reserve).

The final element in problem identification is to establish biological objectives: Objectives are the national, state and locally identified opportunities for biological enhancement that contribute to the nation's economic development or the nation's environmental quality (i.e., opportunity to provide x hunting, fishing and general recreation days at $\$x$/day or x acres of open space in x county for a song bird sanctuary). Early in the planning study, biological objectives are likely to be large in number. Specific

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biological objectives may be in conflict with economic and engineering objectives, but the full range should be set forth as a basis for future planning tasks. These future planning tasks will determine whether the conflicts can be fully or partially resolved by design changes or management progrms or, if not, what trade-offs must be made (i.e., the unavailability of appropriate mitigation lands continguous to the project would require mitigation remote from the project or the cost of mitigation lands may make a plan econimically infeasible).

Formulation of alternatives (task 2) concerns development of different biological management plans to address the biological objectives. Plans must not only identify management resources, but must recognize the plans of others (i.e., a boat ramp that serves island wildlife management needs may also serve the needs of the general boating public).

Impact assessment (task 3) is the identification, description, and, if possible, measurement of the impacts of each alternative plan on the base biological condition. Impact assessment requires forecasting where and when significant primary and higher order impacts could result from implementing a given alternative (i.e., immediate site impacts from building a dam and long term downstream impacts such as climax type change due to reduced flooding over a 100-year period).

Evaluation (task 4) is the analysis of each plan's impacts compared to the without action condition and other plans. After evaluation, the biologists is then in a position to recommend which of the array of alternatives are the most likely to emphasize biological objectives identified in the planning process.

The information derived from this planning process provides the biological basis for the project report and the environmental impact statement.

LITERATURE

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